The Payne Firm, Inc.
Environmental Consultants

11231 Cornell Park Drive
Cincinnati, Ohio 45242
513-489-2255 Fax: 513-489-2533

November 22, 2004

Coolidge, Wall, Womsley & Lombard
33 West First Street, Suite 600
Dayton, Ohio 45402

Attention: Timothy D. Hoffman, Esq.

Reference: South Dayton Dump and Landfill
Proposed National Priorities List (NPL) Listing
Hazard Ranking System Documentation Review
Project No. 0279.44.10

Dear Mr. Hoffman:

At your direction and request, and for the purpose of providing comments to the proposed NPL listing referenced above, The Payne Firm, Inc. (Payne Firm) has reviewed the Hazard Ranking System (HRS) scoring package included in the public docket for the United States Environmental Protection Agency's (USEPA's) September 23, 2004 proposal to add the South Dayton Landfill (SDL) to the National Priorities List.[1] The HRS package was prepared by representatives of the Ohio Environmental Protection Agency (Ohio EPA), Southwest District Office (SWDO) in August 2004. Only the Ground Water Pathway was scored by the Ohio EPA.[2] The scoring information is summarized as follows:

Pathway	Score	Comments
Ground Water Pathway	97.26	—
Surface Water Pathway	Not Scored	("would contribute minimally")
Soil Exposure Pathway	Not Scored	("lack of targets")
Air Pathway	Not Scored	("lack of air analytical data")
HRS Site Score	48.63	(root-mean-square of pathway scores)

Below, we present an executive summary in which we summarize of our conclusions for the convenience of the reader. This is followed by a few general comments after which the results of our review are discussed in detail following the categories from the Ground Water Migration Pathway Scoresheet included in the HRS Documentation Record.

[1] See 69 FR 56970, *et seq.*

[2] The Hazard Ranking System (HRS, 40 CFR Part 300, Appendix A) considers the four potential exposure pathways listed in the above table. Each pathway is scored separately and the overall HRS score is the root-mean-square of the individual pathway scores.

Executive Summary

The Agencies (Ohio EPA and USEPA) have made a number of errors in applying the Hazard Ranking System. When properly evaluated, the South Dayton Landfill does not meet the criteria for inclusion on the National Priorities List.

The HRS Documentation Record prepared by the Ohio EPA, and which serves as the basis for USEPA's proposal to list the site, contains a number of misinterpretations of the available data and other errors which result in an incorrect and substantially inflated score for the site. Our detailed comments, provided in the following sections, are summarized below:

- We agree with the Agencies that it is appropriate to score only the ground water pathway for this site.
- In evaluating Ohio EPA's HRS scoring package, it is important to note that at the conclusion of the Screening Site Inspection (SSI), USEPA and their contractor recommended classifying the site as "No Further Remedial Action Planned" (NFRAP). USEPA did not act on this recommendation solely due to objections from the Ohio EPA.
- Listing the SDL site is inconsistent with USEPA's policy not to commit limited Superfund resources to sites where other enforcement alternatives exist. Here, Ohio's solid waste authority is available to address the site.
- Ohio EPA errs in treating the Great Miami Aquifer as a single unit. There are both an upper and a lower aquifer with a zone of lower permeability material (an aquitard) separating the two.
- Ohio EPA has not met the requirements in the HRS rule for demonstrating interconnectivity between the two aquifers. Therefore, the upper and lower aquifers must be scored separately.
- The targets which Ohio EPA identifies are all in the lower aquifer to which there is no observed release.
- In scoring the upper aquifer, the observed release may appropriately be scored. However, the only target present in the Upper Aquifer is the City of West Carrollton Wellhead Protection Area, the northernmost portion of which is within the four mile Total Distance Limit, the maximum distance from the site at which targets may be scored.
- The score for lower aquifer must be based on a potential release rather than an observed release.
- In any case, Ohio EPA incorrectly measures from the property boundary rather than the source (as they are required to do) in concluding that the City of West Carrollton Wellfield is within four miles of the site. In fact, as stated in Ohio EPA's earlier *Site Team Evaluation Prioritization Report, South Dayton Landfill* (STEP Report), that wellfield is just over four miles from the site. As only targets within four miles (the "Target Distance Limit") may be included in the score, it is inappropriate to include the West Carrollton wells among the potential targets for HRS purposes.[3] Doing so has falsely inflated the score presented by Ohio EPA.[4]
- Similarly, Ohio EPA incorrectly places the Montgomery County Miami Shores Wellfield within the 2 to 3 mile radius. That wellfield is actually within the 3 to 4 mile radius. Making these corrections results in a significantly lower site score.

[3] Targets at any distance may be included in the score if they are affected by hazardous substances from the site. However, in this instance, there is no information that any targets have been affected by releases from the SDL site.
[4] The West Carrollton Wellhead Protection Area extends an appreciable distance north of the actual wellfield. Thus, although a portion of the wellhead protection area is within four miles of the site, the wells are not. This scoring criterion is based on the distance to the wells themselves. This explains the apparent dichotomy in scoring the wellhead protection area but not the population served by the City's wells.

- Although ground water flow direction is not required to be considered in scoring the site, the Agencies' own reports indicate that the Delphi Automotive and the City of Oakwood wellfields are upgradient of the site. As such, even though included in the score, they are not actually potential targets for any releases from the site. Accurately accounting for their upgradient location would further reduce the HRS score for the site.

In sum, the Ohio EPA has made several errors in scoring the South Dayton Landfill which, when corrected would result in an overall HRS score of 14.50, well below the 28.5 threshold which must be achieved in order for the site to be a candidate for inclusion on the NPL. As a result, the site cannot be included as a national priority under Superfund.

General Comments

We agree with the conclusion in the HRS Documentation Record that neither the surface water pathway nor the soil exposure pathway present any significant threats at this site. Further, although Ohio EPA did not score the air pathway due to a lack of data, considering the nature of the wastes and the manner of their disposal at the site, we consider it unlikely that any significant threats exist associated with the air pathway.

Perhaps the most significant omission from the HRS Documentation Record is an important aspect of the history of the Agencies' response activities at the site. That is, following the 1991 Screening Site Inspection, USEPA concluded that the threats associated with this site did not warrant further response actions and recommended this site be classified as "No Further Remedial Action Planned" (NFRAP).[5] This recommendation indicates that USEPA did not believed the threats at the site warranted considering the site a national priority for CERCLA response. The site was not classified as NFRAP solely due to objections from the Ohio EPA.[6]

We concur with the original recommendation. In fact, proposing to list this site on the NPL is counter to USEPA policy not to list sites where there are other legal authorities available to address the environmental issues at the site, thus preserving Superfund resources for sites where no such other regulatory approaches are available. In this case, the site is subject to regulation under Ohio's Solid Waste Law and regulations. As such, and for the reasons discussed *infra*, we do not believe listing this site on the NPL is either appropriate or necessary.

Likelihood of Release to an Aquifer – Ground Water Migration Pathway

The score for this category indicates an observed release to an aquifer and the maximum score is assigned. However, the Agencies incorrectly ignore the fact that the Great Miami Aquifer is described as a two aquifer system consisting of an upper and a lower aquifer separated by a zone of lower hydraulic permeability (an aquitard).[7] As noted in the Ohio EPA-prepared narrative in the HRS Documentation Record, the unconsolidated glacial outwash deposits of the Great Miami Aquifer consist of upper and

[5] Personal conversation between Timothy Hoffman, Esq., and Jeannie Griffith, USEPA, Region V, Pre-Remedial Program as reported by Mr. Hoffman to the Payne Firm.
[6] Ibid.
[7] HRS Documentation Record, Ref.18.

lower aquifers, which are separated by a till-rich zone (zone of lower hydraulic permeability), which is effective in hydraulically separating the two aquifers. Indeed, continuous till zones have been demonstrated both north (NCR site[8]) and south (former Frigidaire site[9]) of the SDL, and its presence at the SDL has been identified at several locations where investigation has extended deep enough.[10]

In their normal course of business, Ohio EPA generally characterizes the till-rich zone in any ground water system in terms of discontinuous clay lenses, thus transferring to the regulated community the burden of demonstrating that these zones are continuous. However, in this instance, it is they who, under the applicable federal regulations, must demonstrate interconnectivity between the aquifers.[11] The Agencies fail to establish such interconnectivity within the radius of concern around the SDL site. Instead, in the narrative contained in the HRS Documentation Record, the Ohio EPA simply describes the various regional attributes of the buried valley aquifer system in order to finesse the need for demonstrating interconnectivity in the vicinity of the site.

To be consistent with the HRS Guidance and regulations, "the approach used in the HRS evaluation and scoring of aquifers is first to establish an aquifer, and then to expand it boundaries, combining it with other aquifers for HRS purposes as information arises to justify the expansion or combination."[12] In this case, the Agencies do not begin by appropriately identifying the upper aquifer as the affected aquifer and then evaluating additional data to assess whether it is appropriate to expand the boundaries to include the lower aquifer, based on demonstrated interconnectivity. HRS Guidance reminds the scorer that "aquifer interconnections cannot be assumed, but must be supported by evidence."[13] Instead, in their efforts to maximize the site score, Ohio EPA relies on a regional characterization without presenting or discussing site-specific information. Their lone site-specific statement that "south of the landfill, the till-rich zone is discontinuous or almost absent, and the upper and lower aquifers function as one hydraulic unit" is contradicted by the ODNR well log information we have reviewed. Indeed, lithologic data from the immediate site vicinity indicates the presence of substantial till layers separating the upper and lower aquifers. Specifically:

- The log of the water well at Valley Asphalt shows till from 60 to 98 feet below ground surface (bgs).
- Logs and ground water level data from a property roughly 0.5 miles north of the SDL site indicate a continuous and effective aquitard is present.[14]
- Four water wells south of the site show till thicknesses of 30 feet, 42 feet, 23 feet plus a second layer 9 feet thick, and 20 feet. (See Attachment 1.)
- As previously noted, continuous till is also reported at both the former Frigidaire and the NCR facilities, south and north of the SDL site, respectively.

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[8] HRS Documentation Record, Ref. 18.
[9] Ibid.
[10] HRS Documentation Record, Ref. 7.
[11] 40 CFR Part 300, Appendix A, §3.0.1.2.1, in pertinent part: "If data are not adequate to establish aquifer interconnections, evaluate the aquifers as separate aquifers."
[12] USEPA's *Hazard Ranking System Guidance Manual*, EPA 540-R-92-026, November 1992.
[13] Ibid.
[14] Personal communication with David Hagen, Senior Vice-President, Haley & Aldrich, concerning unpublished data from an ongoing subsurface investigation at the Delphi Automotive facility approximately 0.5 miles north of the SDL.

- The USGS *Ground Water Resources of Dayton Area, Ohio* shows the till zone at the nearby Dayton Power & Light facility and discusses its apparent variability and effectiveness.[15]
- Since the upper aquifer has been the focus of past investigations at the SDL site, most of the wells installed at the site are not deep enough to have encountered the till zone. However, in the few wells that are sufficiently deep, till was encountered in the borings.[16]
- The Ohio EPA-approved Well Head Protection Plan for the City of West Carrollton contains cross-sections indicating that the till layer is continuous within the well head protection area which extends over four miles from the SDL site. (See Attachment 2.)

Clearly, the weight of evidence is sufficient to conclude that there is a "zone of lower permeability" separating the two aquifers. Again according to the HRS Guidance, "aquifer interconnections cannot be assumed, but must be supported by evidence." The only evidence that Ohio EPA references consists of information from drillers' logs of water production wells. Drillers' logs are notoriously inaccurate and cannot be considered reliable. First, these logs are not prepared by competent geologists or hydrogeologists and drillers are not generally capable of or interested in making the fine distinctions among lithologic units necessary to demonstrate aquifer interconnectivity. In fact, many of these logs are prepared by observing drill cuttings as they are brought to the surface while augering or drilling. It is virtually impossible to prepare an accurate log in this manner as both the depth of origin and the character of the material is often lost in the drilling process. Further, most water well drillers are interested in describing productive water bearing zones and are neither looking for nor recording transitional or thinner non-productive zones. Simply put, if a driller's log indicates a till zone, it is likely present. However, the absence of such an indication is generally not conclusive. For example, USGS information[17] suggests the presence of unlogged till deposits at the nearby Dayton Power & Light facility.

For all of the above reasons, it is clear that Ohio EPA erred in treating the Great Miami Aquifer as a single hydrogeologic unit and did not properly apply the applicable HRS regulations and guidance in scoring this factor.

Given the presence of two aquifers, the appropriate approach is to score both and to use the higher of the two pathway scores in calculating the overall HRS score for the site. Thus, although it may be appropriate to score an an observed release to the upper aquifer, there is no observed release to the lower aquifer. In scoring the upper aquifer, the Observed Release score of 550 may be appropriate. However, as they have identified no drinking water wells screened in this aquifer, the score for the Targets category would be 5.00 as the only target within the allowable four-mile radius is a portion of the City of West Carrollton's wellhead protection area. Assuming no other changes, this would result in a Pathway Score of 1.07 and an overall HRS score of 0.54. In scoring the Potential to Release to the lower aquifer, the factor score would be 240. Even if all of the other factor scores were correct, the resultant Pathway score would then be 42.44 and the overall HRS score would be 21.22. (Various scoring scenarios are presented in Attachment 3.)

As the threshold for NPL listing is 28.5, the South Dayton Landfill does not qualify under either scenario.

[15] HRS Documentation Package, Ref. 18.
[16] HRS Documentation Record, Ref. 7.
[17] HRS Documentation Record, Ref. 18.

It is also important to note that data collected at and around the SDL site since Ohio EPA's 1996 STEP report would not further raise the HRS score (see lack of scoring for other pathways). In fact, as discussed, additional information has been generated to confirm the presence of a till zone separating the upper aquifer from the lower aquifer.

Waste Characteristics – Ground Water Migration Pathway

The Payne Firm has conducted an extensive review of the available information, including historical aerial photographs and property survey maps, and has identified a source area of approximately 16 acres, substantially smaller than the 33 acres included in the HRS Documentation Record and used by Ohio EPA to score the Hazardous Waste Quantity factor in this category. Although the factor score does not change as a result of this disagreement, we raise it here because the identification of source boundaries is important in the discussion of the next category.

Targets – Ground Water Migration Pathway

The manner in which distance-weighted population factors were calculated is fatally flawed.

The error is in the Agencies' failure to distinguish between the property boundary and the source boundary. Distance-weighted population factors are to be evaluated from the source, not from the property.[18] This properly recognizes the fact that there may a considerable distance between the source and the limits of the property. In this instance, the Agencies measured the TDL from the property boundary instead of the source boundary. (See Figure 1.) The result is that two targets to the south of the site are given substantially higher weighting than is appropriate.

Because they included a southern portion of the property within which there is neither a source or an observed release, the Montgomery County Miami Shores Wellfield is incorrectly evaluated as being within the 2 to 3 mile radius of the landfill. In actuality, it is within the 3 to 4 mile radius. Similarly, the City of West Carrollton Wellfield was evaluated as being within the 3 to 4 mile radius when it is actually outside of the four-mile maximum TDL. As a result, the Montgomery County population should be given a much lower distance weighting and the City of West Carrollton population must be excluded from the scoring. The net effect is that both the distance-weighted population factors and the overall ground water pathway score are artificially inflated.

Ironically, the Ohio EPA has had the correct distances in their GIS database for some time. A map of the appropriate 4-mile radius prepared by the Ohio EPA circa 1996 is included as Figure 2. This map clearly indicates the correct radius intervals as described above. Indeed, Ohio EPA's own STEP report indicated, in pertinent part, that the West Carrollton wellfield is "located just over four miles southwest of the site."[19]

Maintaining the Agencies undocumented assumption that, through blending, the Montgomery County wells would, if ever brought back online, serve ten percent of the population in the service area, properly applying the distance weighting for the 3 to 4 mile radius to the Miami Shores Wellfield, and eliminating

[18] *Hazard Ranking System Guidance Manual*
[19] HRS Documentation Record, Ref. 15.

the West Carrollton Wellfield as outside of the maximum TDL, results in a substantially lower score for this factor.

Further, although the HRS scoring algorithm does not provide for the incorporation of known ground water flow directions, it is a matter of agreement among all of the parties that ground water flow from the site has a strong southern component. As a result, it is uncontroverted that neither the Delphi Automotive Systems nor the City of Oakwood Springhouse and Finwood Wellfields are either downgradient of or otherwise threatened by releases from the SDL site. Thus, it is well known to the Agencies that including these as targets significantly overstates the actual threat associated with the South Dayton Landfill.

Revised Scoring

In Attachment 3, we have provided a number of alternate scorings based on the above comments. As can be seen, each of the errors we have identified in the Agencies' current score are fatal even when considered individually. When taken together, the resultant HRS score of 14.50 clearly indicates this site fails to meet the criteria for inclusion on the NPL.

Conclusions

As was previously concluded by USEPA at the conclusion of the SSI, the SDL site does not, when properly evaluated, meet the criteria for listing on the National Priorities List. As such, USEPA should withdraw their proposal to list this site. To ignore the errors we have identified in the current scoring would only add an unwarranted additional demand on the already overburdened Superfund program and would, in our judgment, be an abuse of USEPA's authority and discretion. Further, as other state programs exist to address any risk to human health or the environment from the SDL site, there is no compelling reason for the Agencies to force into the CERCLA process a site which does not on its merits rise to the level of a national priority. Simply put, this site may most appropriately be addressed through Ohio EPA's Solid Waste program.

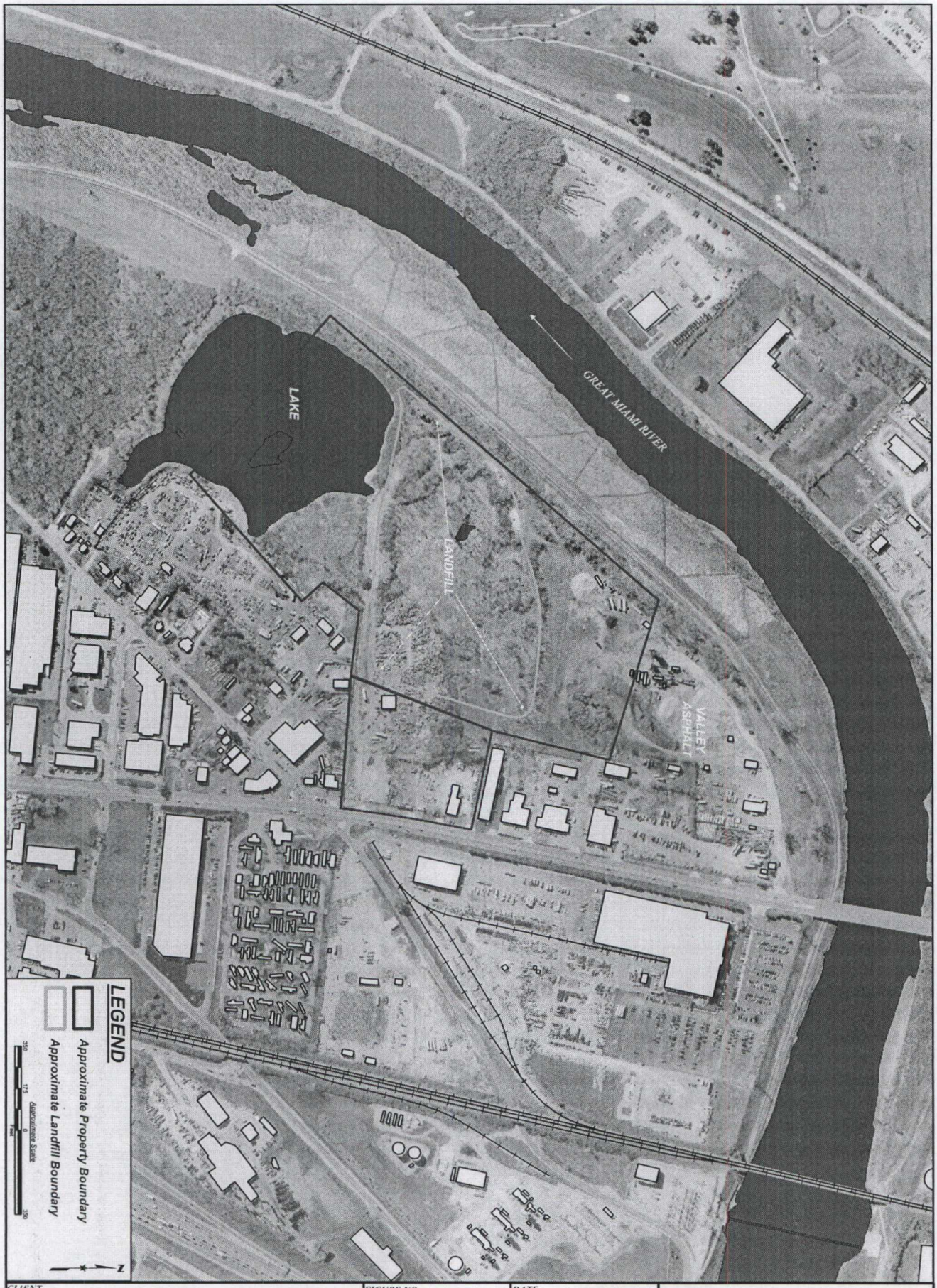
We appreciate this opportunity to be of continuing service to both you and your clients. Please do not hesitate to call if we may be of any additional assistance in this matter.

Sincerely,

The Payne Firm, Inc.

David C. Strayer
Senior Project Manager

Daniel D. Weed, C.P.G.
Principal



CLIENT: COOLIDGE, WALL, WOMSLEY, & LOMBARD	FIGURE NO. 1	DATE 11/22/04	The Payne Firm, Inc. Environmental Consultants Cincinnati, Ohio
TITLE: SOUTH DAYTON LANDFILL PROPERTY AND LANDFILL BOUNDARIES	DRAWN BY JAW	APPROVED BY DCS	
	PROJECT NO. 0279.44.10		
REFERENCE: Montgomery County Orthophotograph, March 2000.			

Figure 2

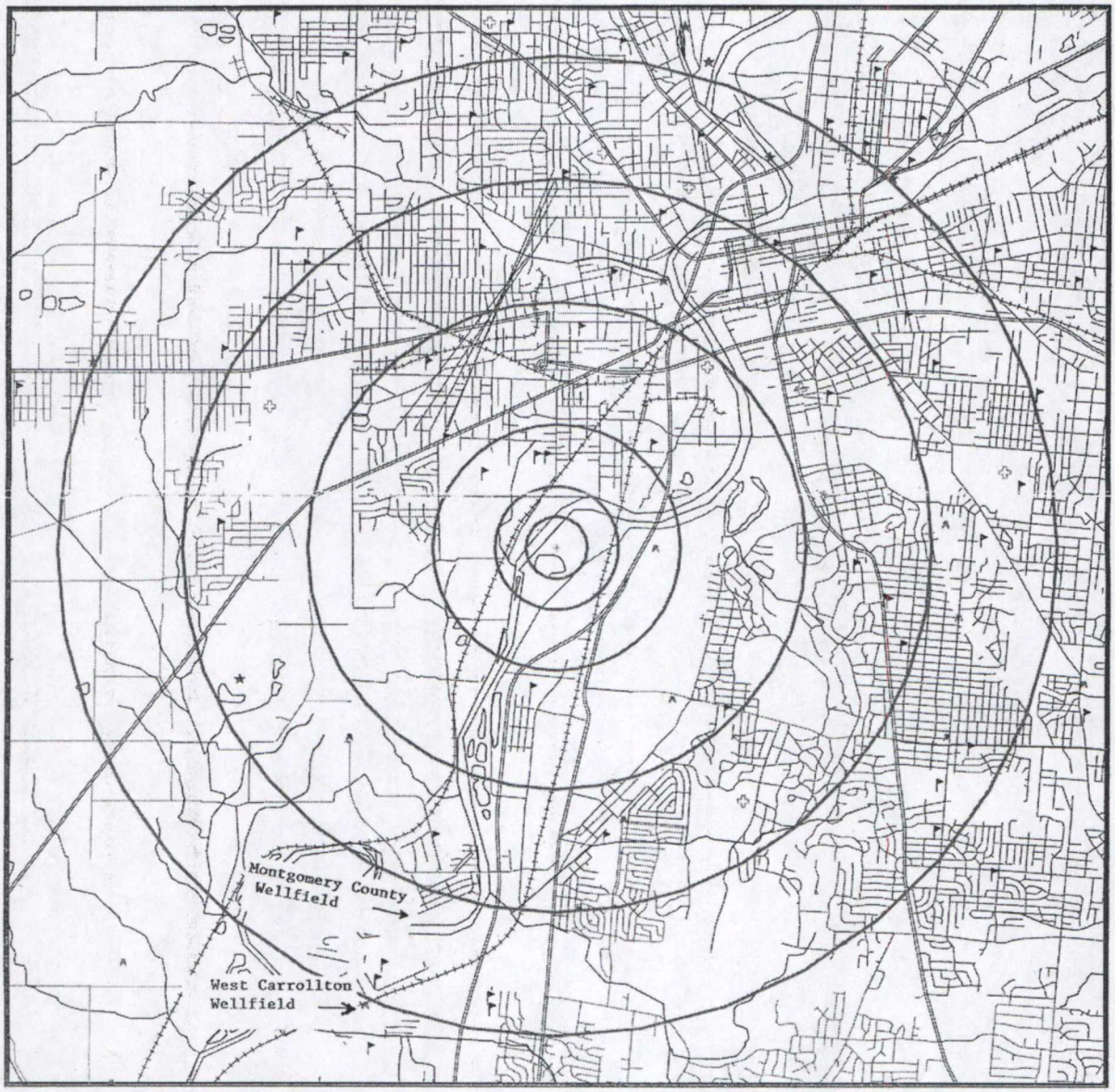
Ohio EPA

Division of Emergency & Remedial Response

GEOGRAPHIC INFORMATION SYSTEM 4-MILE RADIUS MAP

Montgomery County

SOUTH DAYTON DUMP



School
Hospital
FEDERAL ENDANGERED SPECIES
STATE ENDANGERED SPECIES
PUBLIC SURFACE-WATER SYSTEM
PUBLIC GROUND-WATER SYSTEM

COUNTY BOUNDARY
LIMIT OF RADIUS FROM SITE
COUNTY ROAD
MUNICIPAL ROAD
STATE OR FEDERAL HIGHWAY
RAILROAD
STREAM
SITE

1 0 1 2 MILES

N W E S

ATTACHMENT 1

WELL LOGS

WELL LOG AND DRILLING REPORT

ORIGINAL

MISC

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio 43212

PLEASE USE PENCIL OR TYPEWRITER
DO NOT USE INK.

No. 368860

County Montgomery Township Moraine Section or Township 13

Owner Metallurgical Service Address 1353 Stanley ave.

Location of property

CONSTRUCTION DETAILS

Casing diameter 8 Length of casing 95

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST

Pumping Rate 100 G.P.M. Duration of test 1 hrs.

Drawdown 15 ft. Date Sept 1967

Static level-depth to water 45 ft.

Quality (clear) cloudy, taste, odor)

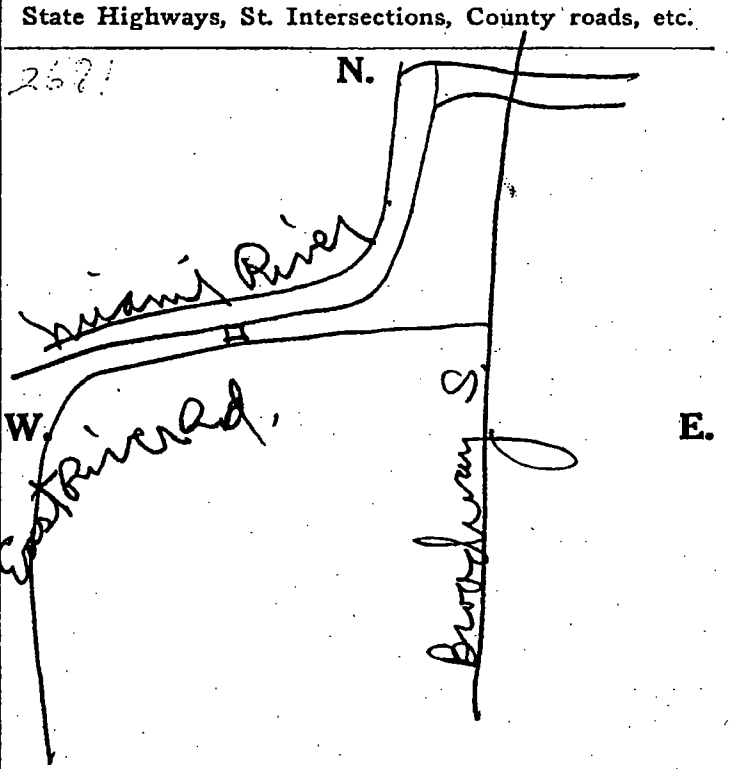
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
fill.	0 Feet	20 Ft.
Gravel	20	40
Clay	40	70
gravel	70	105
1251		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm CLAY P. GARRISON
WELL CONTRACTOR
3901 S. DIXIE DR.
DAYTON 9, OHIO

Date Sept 19 67

Address

Signed Clay P. Garrison

*If additional space is needed to complete well log, use next consecutive numbered form.

Water Well Log and Drilling Report
Ohio Department of Natural Resources
Division of Water
Phone: 614-265-6740
e-mail: water@dnr.state.oh.us
web site: http://www.dnr.state.oh.us

WELL LOG AND DRILLING REPORT

Well Log Number: *368860*

ORIGINAL OWNER AND LOCATION

Original Owners Name: *MELALLURGICAL SERVIC*
County: *MONTGOMERY* **Township:** *MORAIN* **Section #:** *13*
Address: *RIVER ROAD* **Lot #:**
City: **State:** *OH* **Zip Code:**

CONSTRUCTION DETAILS

Borehole Diameter: **Casing Diameter:** *8 in.* **Casing Thickness:** **Casing Length:** *95 ft.*
Borehole Diameter: **Casing Diameter:** **Casing Thickness:** **Casing Length:** *95 ft.*
Total Depth: *105 ft.* **Depth to Bedrock:** **Screen Length:**
Well Use: **Date of Completion:** *9/19/67*
Aquifer Type:
Driller's Name: *GARRISON CLAY P*

WELL TEST DETAILS

Static Water Level: *45 ft.* **Test Rate:** *100 gpm*
Drawdown: *15 ft.* **Test Duration:** *1 hrs.*

WELL LOG

Associated Reports
NONE

Formations	From	To
FILL MATERIAL	0	- 20
GRAVEL	20	- 40
CLAY	40	- 70
GRAVEL	70	- 105

County Permit No. _____

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

WELL LOG AND DRILLING REPORT

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

ORIGINAL

DMD

557902

COUNTY Montgomery TOWNSHIP City of Moraine SECTION OF TOWNSHIP 13

OWNER Mid-States Development ADDRESS Dayton, Ohio

LOCATION OF PROPERTY Corner of East river and Arbor, Delco Air Parking Lot

CONSTRUCTION DETAILS

Casing diameter 12" Length of casing 70'

Type of screen S.S. Length of screen 30'

Type of pump Pioneer Z-1000

Capacity of pump 1250 gpm @ 40'

Depth of pump setting _____

Date of completion 10/7/80

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 1100 gpm Duration of test 24 hrs

Drawdown 7.08 ft Date 10/14/80

Static level (depth to water) 23.13 ft

Quality (clear, cloudy, taste, odor) Clear

Pump installed by Moody's of Dayton, Inc.

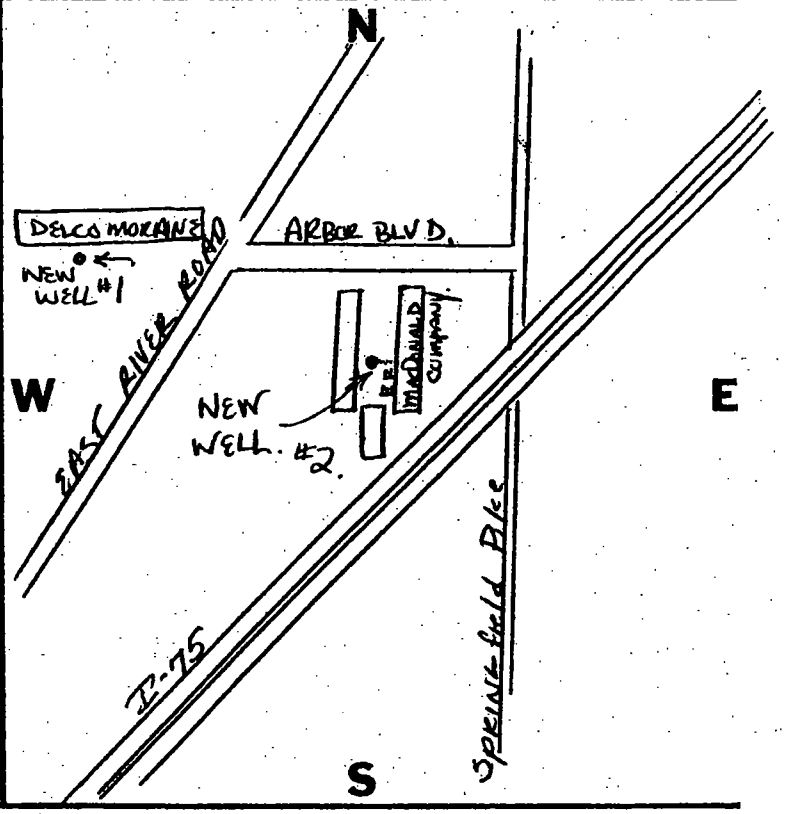
Well #1

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
verlay	0 ft	4 ft
y ash	4	22
ocal fill (HARD PAN)	22	44
.11 (hard pan)	44	64
arse to fine sand & gravel	64	84
arse to fine sand & gravel	84	100
5412		

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM Moody's of Dayton, Inc. DATE November 28, 1980

ADDRESS 4359 Infirmary Rd., P.O. Box 123, Miamisburg, Ohio 45342 SIGNED Jennie Cramer

*If additional space is needed to complete well log, use next consecutive numbered form.

Water Well Log and Drilling Report
Ohio Department of Natural Resources
Division of Water
Phone: 614-265-6740
e-mail: water@dnr.state.oh.us
web site: http://www.dnr.state.oh.us

WELL LOG AND DRILLING REPORT

Well Log Number: *557902*

ORIGINAL OWNER AND LOCATION

Original Owners Name: *MID-STATES DEVELOPME*
County: *MONTGOMERY* **Township:** *MORAIN* **Section #:** *13*
Address: *RIVER/ARBOR ROAD* **Lot #:**
City: **State:** *OH* **Zip Code:**

CONSTRUCTION DETAILS

Borehole Diameter: **Casing Diameter:** *12 in.* **Casing Thickness:** **Casing Length:** *70 ft.*
Borehole Diameter: **Casing Diameter:** **Casing Thickness:** **Casing Length:** *70 ft.*
Total Depth: *100 ft.* **Depth to Bedrock:** **Screen Length:**
Well Use: **Date of Completion:** *11/28/80*
Aquifer Type:
Driller's Name: *MOODY'S OF DAYTON, INC.*

WELL TEST DETAILS

Static Water Level: *23.1 ft.* **Test Rate:** *1100 gpm*
Drawdown: *7.1 ft.* **Test Duration:** *24 hrs.*

WELL LOG

Associated Reports
NONE

Formations	From	To
SURFACE	0	- 22
HARDPAN	22	- 44
TILL	44	- 64
MIXED SAND AND GRAVEL	64	- 84
MIXED SAND AND GRAVEL	84	- 100

County Permit No. _____

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

WELL LOG AND DRILLING REPORT

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

ORIGINAL

557903

COUNTY Montgomery TOWNSHIP City of Moraine SECTION OF TOWNSHIP 13

OWNER Mid States Development ADDRESS Dayton, Ohio

LOCATION OF PROPERTY Parking Lot of E. F. MacDonald Co. between I-75 and Arbor Blvd.

CONSTRUCTION DETAILS

Casing diameter 12" Length of casing 68'

Type of screen S.S. Cook Length of screen 32'

Type of pump Pioneer Z-1000

Capacity of pump 1000 gpm @ 60'

Depth of pump setting 40'

Date of completion 11/7/80

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 1250 gpm Duration of test 4 hrs

Drawdown 35.19 ft Date 11-10-80

Static level (depth to water) 19.51 ft

Quality (clear, cloudy, taste, odor) Clear

Pump installed by Moody's of Dayton, Inc.

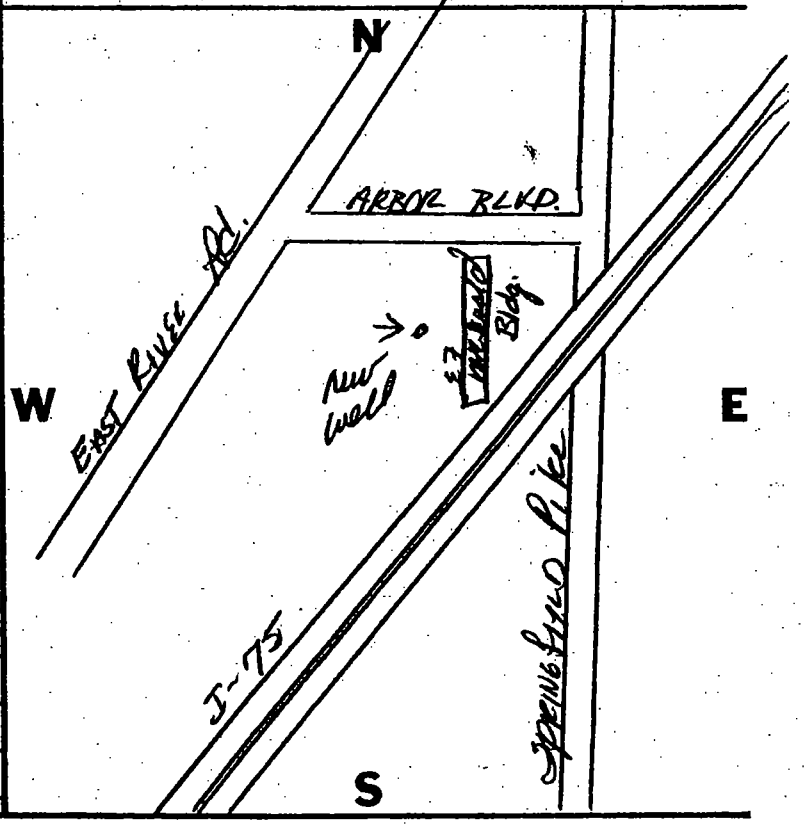
Well #2

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
ill	0 ft	4 ft
ly ash	4	15
lay w/gravelly hard pan	15	38
and and gravel	38	48
lay	48	57
and, med to fine and coarse gravel	57	100
5412		

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM Moody's of Dayton, Inc.

ADDRESS 4359 Infirmary Rd., P.O. Box 123
Miamisburg, Ohio 45342

DATE November 28, 1980

SIGNED Kenneth L. Cramer

*If additional space is needed to complete well log, use next consecutive numbered form.

Water Well Log and Drilling Report
Ohio Department of Natural Resources
Division of Water
Phone: 614-265-6740
e-mail: water@dnr.state.oh.us
web site: http://www.dnr.state.oh.us

WELL LOG AND DRILLING REPORT

Well Log Number: *557903*

ORIGINAL OWNER AND LOCATION

Original Owners Name: *MID-STATES DEVELOPME*
County: *MONTGOMERY* **Township:** *MORAIN* **Section #:** *13*
Address: *ARBOR BLVD* **Lot #:**
City: **State:** *OH* **Zip Code:**

CONSTRUCTION DETAILS

Borehole Diameter: **Casing Diameter:** *12 in.* **Casing Thickness:** **Casing Length:** *68 ft.*
Borehole Diameter: **Casing Diameter:** **Casing Thickness:** **Casing Length:** *68 ft.*
Total Depth: *100 ft.* **Depth to Bedrock:** **Screen Length:**
Well Use: **Date of Completion:** *11/28/80*
Aquifer Type:
Driller's Name: *MOODY'S OF DAYTON, INC.*

WELL TEST DETAILS

Static Water Level: *19.5 ft.* **Test Rate:** *1250 gpm*
Drawdown: *35.2 ft.* **Test Duration:** *4 hrs.*

WELL LOG

Associated Reports
NONE

Formations	From	To
SURFACE	0	- 15
GRAVELLY CLAY/HARDPAN	15	- 38
SAND AND GRAVEL	38	- 48
CLAY	48	- 57
MIXED SAND AND GRAVEL	57	- 100

Water Well Log and Drilling Report
Ohio Department of Natural Resources
Division of Water
Phone: 614-265-6740
e-mail: water@dnr.state.oh.us
web site: http://www.dnr.state.oh.us

WELL LOG AND DRILLING REPORT

Well Log Number: *439607*

ORIGINAL OWNER AND LOCATION

Original Owners Name: *MORAINE RECYCLING CO*
County: *MONTGOMERY* **Township:** *MORAIN* **Section #:** *13*
Address: *BROADWAY* **Lot #:**
City: **State:** *OH* **Zip Code:**

CONSTRUCTION DETAILS

Borehole Diameter: **Casing Diameter:** *6 in.* **Casing Thickness:** **Casing Length:** *115 ft.*
Borehole Diameter: **Casing Diameter:** **Casing Thickness:** **Casing Length:** *115 ft.*
Total Depth: *115 ft.* **Depth to Bedrock:** **Screen Length:**
Well Use: **Date of Completion:** *6/10/72*
Aquifer Type:
Driller's Name: *GARRISON CLAY P*

WELL TEST DETAILS

Static Water Level: *55 ft.* **Test Rate:***85 gpm*
Drawdown: *20 ft.* **Test Duration:** *2 hrs.*

WELL LOG

Associated Reports
NONE

Formations	From	To
FILL MATERIAL	0	- 15
GRAVEL	15	- 75
CLAY	75	- 95
SAND AND GRAVEL	95	- 104
GRAVEL	104	- 115

Water Well Log and Drilling Report
Ohio Department of Natural Resources
Division of Water
Phone: 614-265-6740
e-mail: water@dnr.state.oh.us
web site: http://www.dnr.state.oh.us

WELL LOG AND DRILLING REPORT

Well Log Number: *394492*

ORIGINAL OWNER AND LOCATION

Original Owners Name: *VALLEY ASPHALT CORP*
County: *MONTGOMERY* **Township:** *MORAIN* **Section #:**
Address: *1901 SPRINGBORO ROAD* **Lot #:**
City: **State:** *OH* **Zip Code:**

CONSTRUCTION DETAILS

Borehole Diameter: **Casing Diameter:** *8 in.* **Casing Thickness:** **Casing Length:** *99 ft.*
Borehole Diameter: **Casing Diameter:** **Casing Thickness:** **Casing Length:** *99 ft.*
Total Depth: *108 ft.* **Depth to Bedrock:** **Screen Length:**
Well Use: **Date of Completion:** *8/18/69*
Aquifer Type:
Driller's Name: *GARRISON CLAY P*

WELL TEST DETAILS

Static Water Level: *55 ft.* **Test Rate:** *120 gpm*
Drawdown: *10 ft.* **Test Duration:** *2 hrs.*

WELL LOG

Associated Reports
NONE

Formations	From	To
FILL MATERIAL	0	- 50
GRAVEL	50	- 60
CLAY	60	- 98
GRAVEL	98	- 108

ATTACHMENT 2

CROSS-SECTIONS FROM OHIO EPA-APPROVED CITY OF WEST CARROLLTON WELLHEAD PROTECTION PLAN

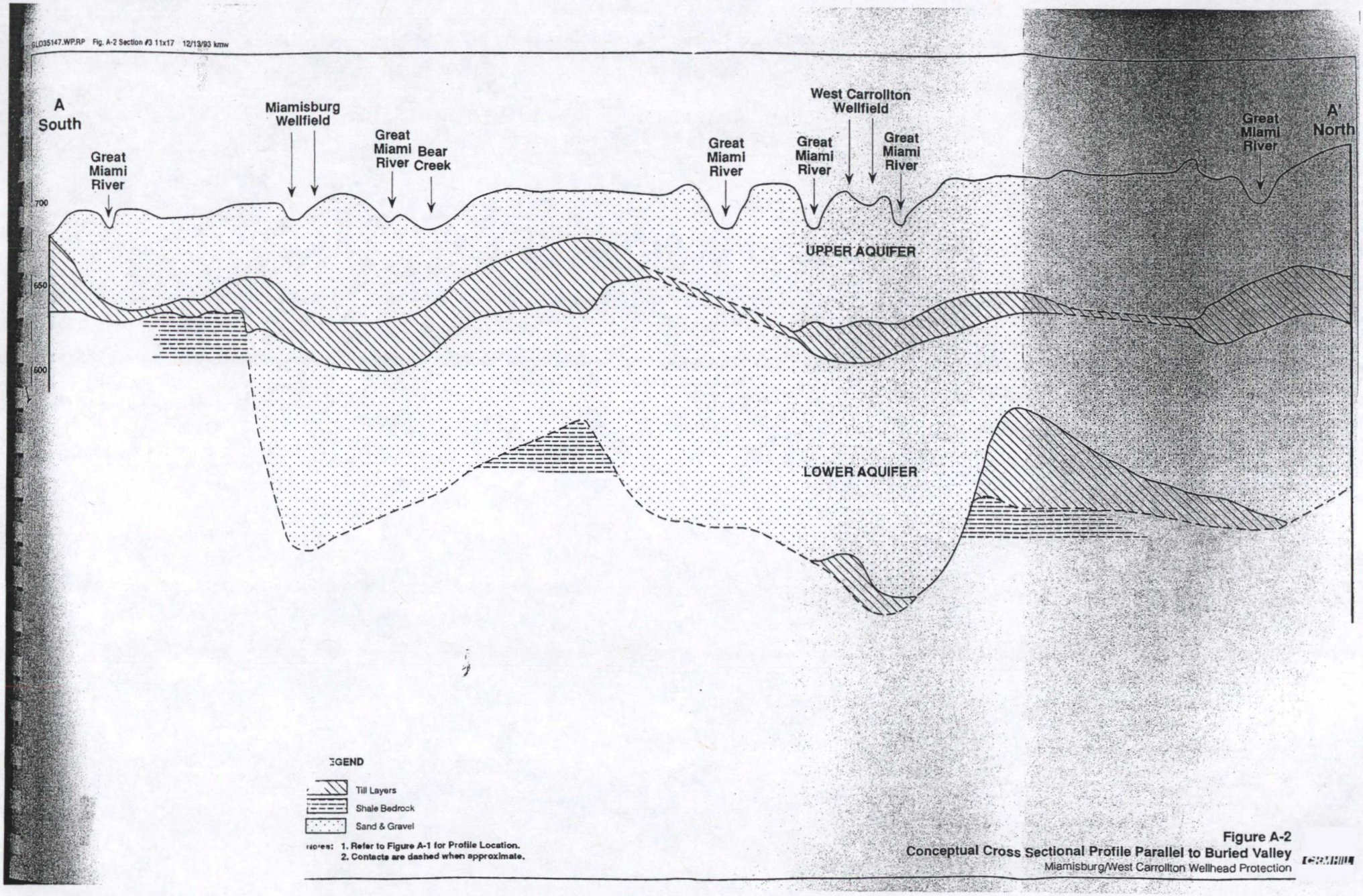


Figure A-2
Conceptual Cross Sectional Profile Parallel to Buried Valley
Miamisburg/West Carrollton Wellhead Protection

ATTACHMENT 3

CORRECTED HRS SCORING

Attachment 3.1
Two Aquifer Scenario
Potential Release to Lower Aquifer

Site Name: South Dayton Landfill

Region: 5

City, County, State: Moraine, OH

Evaluator: The Payne Firm, Inc.

EPA ID#: OHD 980 611 388

Date: November 22, 2004

Lat/Long:

T/R/S:

Congressional District:

This Scoresheet is for:

Scenario Name: Two Aquifer Scenario

Description: Potential Release to Lower Aquifer

	S pathway	S^2 pathway
Ground Water Migration Pathway Score (S_{gw})	42.44	1801.1536
Surface Water Migration Pathway Score (S_{sw})	0	0
Soil Exposure Pathway Score (S_s)	0	0
Air Migration Score (S_a)	0	0
$S^2_{gw} + S^2_{sw} + S^2_s + S^2_a$		1801.1536
$(S^2_{gw} + S^2_{sw} + S^2_s + S^2_a)/4$		450.2884
$/ (S^2_{gw} + S^2_{sw} + S^2_s + S^2_a)/4$		21.22

υ Pathways not assigned a score (explain):

TABLE 3-1 --GROUND WATER MIGRATION PATHWAY SCORESHEET

Factor categories and factors	Maximum Value	Value Assigned	
Aquifer Evaluated: Lower Aquifer			
Likelihood of Release to an Aquifer:			
1. Observed Release	550	0	
2. Potential to Release:			
2a. Containment	10	10	
2b. Net Precipitation	10	6	
2c. Depth to Aquifer	5	3	
2d. Travel Time	35	15	
2e. Potential to Release [lines 2a(2b + 2c + 2d)]	500	240	
3. Likelihood of Release (higher of lines 1 and 2e)	550		240
Waste Characteristics:			
4. Toxicity/Mobility	(a)	10000	
5. Hazardous Waste Quantity	(a)	100	
6. Waste Characteristics	100		32
Targets:			
7. Nearest Well	(b)	9	
8. Population:			
8a. Level I Concentrations	(b)	0	
8b. Level II Concentrations	(b)	0	
8c. Potential Contamination	(b)	441.9	
8d. Population (lines 8a + 8b + 8c)	(b)	441.9	
9. Resources	5	0	
10. Wellhead Protection Area	20	5	
11. Targets (lines 7 + 8d + 9 + 10)	(b)		455.9
Ground Water Migration Score for an Aquifer:			
12. Aquifer Score [(lines 3 x 6 x 11)/82,5000][c]	100		42.4401454545455
Ground Water Migration Pathway Score:			
13. Pathway Score (S_{gw}), (highest value from line 12 for all aquifers evaluated)[c]	100		42.4401454545455

[a] Maximum value applies to waste characteristics category
[b] Maximum value not applicable
[c] Do not round to nearest integer

Attachment 3.2
Two Aquifer Scenario
Potential Release to Lower Aquifer

Site Name: South Dayton Landfill
Region: 5

City, County, State: Moraine, OH
Evaluator: The Payne Firm, Inc.

EPA ID#: OHD 980 611 388
Date:

Lat/Long:
T/R/S:

Congressional District:

This Scoresheet is for:

Scenario Name: Two Aquifers/Adjusted Distance-Population Factors

Description: Potential Release to Lower Aquifer and adjusted distance-weighted population factors

	S pathway	S^2 pathway
Ground Water Migration Pathway Score (S_{gw})	29	841
Surface Water Migration Pathway Score (S_{sw})	0	0
Soil Exposure Pathway Score (S_s)	0	0
Air Migration Score (S_a)	0	0
$S^2_{gw} + S^2_{sw} + S^2_s + S^2_a$		841
$(S^2_{gw} + S^2_{sw} + S^2_s + S^2_a)/4$		210.25
$/ (S^2_{gw} + S^2_{sw} + S^2_s + S^2_a)/4$		14.5

υ Pathways not assigned a score (explain):

TABLE 3-1 –GROUND WATER MIGRATION PATHWAY SCORESHEET

Factor categories and factors	Maximum Value	Value Assigned	
Aquifer Evaluated: Lower Aquifer			
Likelihood of Release to an Aquifer:			
1. Observed Release	550	0	
2. Potential to Release:			
2a. Containment	10	10	
2b. Net Precipitation	10	6	
2c. Depth to Aquifer	5	3	
2d. Travel Time	35	15	
2e. Potential to Release [lines 2a(2b + 2c + 2d)]	500	240	
3. Likelihood of Release (higher of lines 1 and 2e)	550		240
Waste Characteristics:			
4. Toxicity/Mobility	(a)	10000	
5. Hazardous Waste Quantity	(a)	100	
6. Waste Characteristics	100		32
Targets:			
7. Nearest Well	(b)	9	
8. Population:			
8a. Level I Concentrations	(b)	0	
8b. Level II Concentrations	(b)	0	
8c. Potential Contamination	(b)	297.5	
8d. Population (lines 8a + 8b + 8c)	(b)	297.5	
9. Resources	5	0	
10. Wellhead Protection Area	20	5	
11. Targets (lines 7 + 8d + 9 + 10)	(b)		311.5
Ground Water Migration Score for an Aquifer:			
12. Aquifer Score [(lines 3 x 6 x 11)/82,5000][c]	100		28.9978181818182
Ground Water Migration Pathway Score:			
13. Pathway Score (S_{gw}), (highest value from line 12 for all aquifers evaluated)[c]	100		28.9978181818182

[a] Maximum value applies to waste characteristics category
[b] Maximum value not applicable
[c] Do not round to nearest integer

Line 8c Calculations:

Radius	Targets	Factor
0 to ¼ mile	0	0
¼ to ½ mile	0	0
½ to 1 mile	220 (Delphi Automotive)	52
1 to 2 miles	3855 (Oakwood – Springhouse)	939
2 to 3 miles	5140 (Oakwood – Finwood)	678
3 to 4 miles	13,454 (Montgomery County)	1,306
	$\sum$=	2,975 ÷ 10 = 297.5

Note: Montgomery County adjusted to the 3 to 4 mile radius and City of West Carrollton deleted as outside the 4-mile TDL.